

Work Order ID 76349

76349

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November-09-11 10:53:14 AM

Item ID: D205-634-041 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: Replacement Skidtube
 Start Date: 09/11/2011 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 25/11/2011 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: M.L.J Date: 11/11/09 Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr
D2580-041	Rev.E

100		0.00							
100	DOCUMENT CONTROL								
DC	Memo	0.00							
Document Control	Photocopy D205-634 bluefile & type labels per PPP D205-634-041 CHG002								

N/A

110		0.00							
110	BENDING MACHINE - SKIDTUBES								
CNC Bend 1	Memo	0.00							
CNC Delta 100 Bender	1-Bend as per program D2580.C on CNC Bender and Folio 16								
	2-Cut tubes as per Dwg. D2580								
	3- scribe batch# in aft end of tube								

JW 11-11-16

11-11-16

mo

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120		0.00							
120									
Skidtubes	Memo	0.00							
Skidtubes	1- Deburr ends and remove bending marks								
	2- Prepare tube for welding as per QSI 004								
130	QC5- Inspect part completeness to step on W/O	0.00							
130									
QC	Memo	0.00							
Quality Control									

XSAO 11-11-11

0

1 0 BE11-11-21

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Accept

N9000040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Replacement Skidtube

Start Date: 09/11/2011 Start Qty: 1.00

1

Cust Item ID:

Required Date: 25/11/2011 Req'd Qty: 1.00

1

Customer:

Reference:

Run Start *NR1*

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop *NR2*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

140

0.00

140

Skidtubes

Skidtubes

Memo

0.00

1-Weld step D2576 as per Dwg. D2580 and OSI 004
A/R Aluminum Rod *M118735*

BE 11-11-21

2-Grind welds on step as per Dwg D2580

3-Weld spacers as per dwg D2580 *A/R M118735* *BE 11-11-21*

3- *** N/A**** Insert D4202-1 spacer, swage as per QSI002 and trim/ grind
flush per QSI002 and dwg. Hold x-bolt with DT9701 Use tube expander 1/2
x17G to start expansion and finish with 1/2 x 18G to achieve dwg dimension.

BE 11/11/22

4-Drill holes for wearplates using DT 8217 & DT8937 Open holes to 19/64",
adjust stopper not to hit web. Debur

6-Drill pilot holes for aft cap using DT 8215 Open holes to 0.208". Debur

GAD 11-11-22

7-Drill pilot holes for Tow ring using DT8091, open to .640" and Debur

C-Bore

DP 11-11-22

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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N900040100

Setup Start *NS1*

Stop *NS2*

Item Name: Replacement Skidtube

Start Date: 09/11/2011 **Start Qty:** 1.00

*** 1 ***

Cust Item ID:

Required Date: 25/11/2011 **Req'd Qty:** 1.00

*** 1 ***

Customer:

Reference:

Run Start *NR1*

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

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150 QC10- Inspect visual per QSI004- ground welds

0.00

150

0.00

QC

Memo

Quality Control

160 QC5- Inspect part completeness to step on W/O

0.00

160

0.00

QC

Memo

Quality Control

170 Pressure Wash per QSI005 4.3

0.00

170

0.00

HandFinish

Memo

Hand Finishing

Re-alodine tube as per QSI 005 section 4.1.2.1 do not acid etch and leave fwd cap out of solution..

IX Øm, 11/11/22

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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180	White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum	0.00							
180 Powdercoat	Memo	0.00							
Powder Coating	START TIME: 7:50 OVEN TEMPERATURE: 320 FINISH TIME: 8:20								
190	QC3- Inspect Part Finish	0.00							
190 QC	Memo	0.00							
Quality Control									

IXØ M-L M/M 23

1 BR 11-11-23.

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Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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200

0.00

200

HandFinish

Hand Finishing

Memo

1-Install inserts & wearplates & Gaskets as per Dwg. D2580. Use a drop of Sikaflex on insert holes before installing wearplates

A/R Sikaflex-291

Sikaflex expire date: 11-9-13

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step & Aft Cap with Sikaflex. Clean excess adhesive

A/R Sikaflex-291

Sikaflex expire date: 12-1

5-Wing Walk as per Dwg D2580 and QSI 005 4.4

Batch: 1189881 GR 11-11-23.

Dart Aerospace Ltd

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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210 *210* QC Quality Control	QC5- Inspect part completeness to step on W/O Memo Inspect Aft Cap, Fwd Step and Wing Walk of work to Current Step Inspect for Foreign objects per QSI 024	0.00 0.00							
220 *220* Packaging Packaging Packaging	Packaging Memo Identify and pack for shipping as per PPPD205-634-041 Location: _____ PPP Rev: _____	0.00 0.00							
230 *230* QC Quality Control	QC21- Final Inspection - Work Order Release Memo	0.00 0.00							

Sulu/23

PP 76443

11/11/23

11/11/23

mf 11-11-23

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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Picklist Print

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Work Order ID: 76349

76349

Parent Item: D205-634-041

D205-634-041

Parent Item Name: Replacement Skidtube

Start Date: 09/11/2011

Required Date: 25/11/2011

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP Rev:N 02.08.28 FP was QC5 in Step 27; Added QC5 to Step 30
 KJ IPP Rev P 10.02.19
 per PAR09-043 EC verified by:DD
 IPP Rev. O 06.02.28 Added paperwork EC
 IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM IPP Rev:Q
 10.12.01 as per chg003 DD ver:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
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D4202-1 Manufactured No

140

Each

492.0000

20

20

D4202-1

D2579

**

Spacer

BE11-11-21
 B76002 *20

Location

Loc Qty

Loc Code

LG002

492

66929

106

67129

196

67308

1

67430

140

72639

49

D2580-1 Manufactured No

110

Each

5.0000

1

1

D2580-1

205 Skidtube bent detail

B 76424

**

①

JW 11-11-16

Location

Loc Qty

Loc Code

LG

3

72965

1

75282

2

ST046

2

75284

2

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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Work Order ID: 76349

76349

Parent Item: D205-634-041

D205-634-041

Parent Item Name: Replacement Skidtube

Start Date: 09/11/2011

Required Date: 25/11/2011

Start Qty: 1.00

Required Qty: 1.00

D2576-3 Manufactured No

140 Each 112.0000 1 1

D2576-3

Step (maching detail)

**

BE 11-11-21

Location

Loc Qty

Loc Code

LG

112

66156

12

70883

50

74136

50

D2855 Manufactured No

200 Each 11.0000 1 1

D2855

Cap

**

BR 11-11-23.

Location

Loc Qty

Loc Code

FP007

11

65519

2

65569 ✓

9

AN3-5A Purchased No

200 Each 926.0000 2 2

AN3-5A

Bolt

**

BR 11-11-23.

Location

Loc Qty

Loc Code

ST350

926

115371

46

117423 ✓

380

118626

300

119355

200

AN960JD10L *✱* NAS1149D0332L ✓ Purchased No

200 Each 0.0000 2 2

***AN960JD101 ***

Washer

**

2 BR 11-11-23.

118389

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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Work Order ID: 76349

76349

Parent Item: D205-634-041

D205-634-041

Parent Item Name: Replacement Skidtube

Start Date: 09/11/2011

Required Date: 25/11/2011

Start Qty: 1.00

Required Qty: 1.00

ALS7-1032-130

Purchased

No

200

Each

2,049.000

50

50

AI S7-1032-130

**

BR 11-11-23.

Insert

Location

Loc Qty

Loc Code

ST281

113

117717

27

118966

86

ST282

1936

119530 ✓

1936

50

AN3C4A

Purchased

No

200

Each

2,235.000

50

50

AN3C4A

**

BR 11-11-23.

BOLT

Location

Loc Qty

Loc Code

ST350

2235

117313

2

117688

5

117872

22

118112

16

118451

2

118706

214

118838

974

119328 ✓

1000

50

AN960C10L

NAS1149C0332 ✓

Purchased

No

200

Each

0.0000

50

50

*AN960C10I *

**

50 BR 11-11-23.

washer

119124.

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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Work Order ID: 76349

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Parent Item: D205-634-041

D205-634-041

Parent Item Name: Replacement Skidtube

Start Date: 09/11/2011

Required Date: 25/11/2011

Start Qty: 1.00

Required Qty: 1.00

D3566-13 Manufactured No

200 Each 31.0000 1 1

D3566-13

Gasket

**

BR 11-11-23

Location

Loc Qty

Loc Code

FP

29

73322 ✓

29

FP014

2

68341

1

72149

1

D3566-5 Manufactured No

200 Each 31.0000 1 1

D3566-5

Gasket

**

BR 11-11-23

Location

Loc Qty

Loc Code

FP002

31

74387 ✓

9

75069

22

D3566-1 Manufactured No

200 Each 35.0000 2 2

D3566-1

Gasket

**

BR 11-11-23

Location

Loc Qty

Loc Code

FP002

33

73303

7

74518 ✓

26

FP015

2

68924

2

D3564-11 Manufactured No

200 Each 6.0000 1 1

D3564-11

Wearshoe

**

BR 11-11-23

Location

Loc Qty

Loc Code

FP019

6

73146

6

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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D205-634-041

Parent Item Name: Replacement Skidtube

Start Date: 09/11/2011

Required Date: 25/11/2011

Start Qty: 1.00

Required Qty: 1.00

D3564-13 Manufactured No

200 Each 18.0000 1 1

D3564-13

Wearshoe

**

BR 11-11-23

Location

Loc Qty

Loc Code

FP001

17

73323 ✓

17

FP017

1

71594

1

D3564-9 Manufactured No

200 Each 17.0000 1 1

D3564-9

Wearshoe

**

BR 11-11-23

Location

Loc Qty

Loc Code

FP

12

73345 ✓

12

FP019

5

67590

4

69943

1

D3564-5 Manufactured No

200 Each 23.0000 1 1

D3564-5

Wearshoe

**

BR 11-11-23

Location

Loc Qty

Loc Code

FG

2

34806

2

FP001

12

74543 ✓

12

FP19

9

73330

9

Dart Aerospace Ltd

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D205-634-041

Parent Item Name: Replacement Skidtube

Start Date: 09/11/2011

Required Date: 25/11/2011

Start Qty: 1.00

Required Qty: 1.00

D2594-3 Manufactured No

200 Each 752.0000 16 16

D2594-3

O-Ring, 205 Skidtube

**

BR 11-11-03.

Location

Loc Qty

Loc Code

FP004

198

73490

198

FP-A

554

65518

41

66952

215

73490

298

16.

D2594-1 Manufactured No

200 Each 368.0000 16 16

D2594-1

Plug, 205 Skidtube

**

BR 11-11-03.

Location

Loc Qty

Loc Code

FP

368

73401

368

16.

7442

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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LIST OF MATERIALS					PART NUMBER	DESCRIPTION
ITEM	QTY -041	QTY -045	QTY -047			
1	X				D2580-041	SKIDTUBE ASSEMBLY
2		X			D2580-045	SKIDTUBE ASSEMBLY
3			X		D2580-047	SKIDTUBE ASSEMBLY
4	1	1	1		D2500-1-190	EXTRUSION
5			16		D2570	BUSHING
6	1	1	1		D2576-3	STEP
7	20	24	25		D2579	SPACER
8	16	16	8		D2594-1	PLUG
9	16	16	8		D2594-3	O-RING
10	1	1	1		D2596	205 WEB
11	1	1	1		D2855	AFT CAP
12	1	1			D3564-5	WEARSHOE
13	1	1			D3564-9	WEARSHOE
14	1	1			D3564-11	WEARSHOE
15	1	1			D3564-13	WEARSHOE
16	2	2			D3566-1	GASKET
17	1	1			D3566-5	GASKET
18	1	1			D3566-13	GASKET
19			1		D4406-041	WEARPLATE ASSEMBLY
20			1		D4406-043	WEARPLATE ASSEMBLY
21	50	50			ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AELS-1032-130	INSERT
22	50	50			AN3C4A	BOLT
23	2	2	2		AN3-5A	BOLT
24			8		AN4-45A	BOLT
25	50	50			NAS1149C0332R	WASHER (AN960C10L)
26	2	2	2		NAS1149D0332J	WASHER (AN960JD10L)
27			8		MS21042-4	NUT (OR MS21042L4)

GENERAL NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: CHEMICAL CONVERSION PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB
POWDER COAT ASSEMBLY (-041/-047) GLOSS WHITE (REF 4.3.5.1) PER DART QSI 005 4.3
POWDER COAT ASSEMBLY (-045) GREEN SANDEX (REF 4.3.5.8) PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4.
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: D2580-041 = 34.5 lbs
D2580-045 = 34.5 lbs
D2580-047 = 37.7 lbs
- 8) WELDING PER DART QSI 004.
- 9) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 10) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 11) USE DART DRILL TEMPLATE DT8217 & DT8937 ONLY FOR D2580-041/-045 TO LOCATE AND DRILL Ø0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTIONS B-B AND F-F (50 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND NAS1149C0332R WASHERS WITH SIKAFLEX-241/291.
- 12) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES FOR D2580-041/-045 AND 8 PLACES FOR D2580-047)
- 13) IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE WITH THE SPACER AT THIS LOCATION

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2011-08-29
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WORK ORDER
NO. 76349 M.C.5
11/1/09

E	ADD D2580-047 (ZN C4-7) AND D2580-7 (ZN B3-8); INCLUDED DEO D2580-D-1; REFORMATTED DRAWING TO CURRENT STANDARDS; DT8217 & DT8937 WAS TD2577-205 (ZN C4-1)	RF	11.06.21
D	CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124/ 9183	PH	07.04.05
C	REDRAWN, INCLUDED DEO 9094/ 9097	CP	98.08.26
B	AS MANUFACTURED	DS	96.12.02
A	NEW ISSUE	DS	96.09.16
REV.	DESCRIPTION	BY	DATE
DESIGN	#		
DRAWN	RF		
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MFG. APPR.	10		
APPROVED	10		
DE APPR.	10		
DATE	11.06.21		
DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA DRAWING NO. D2580 REV. E SHEET 1 OF 8 TITLE 205 SKIDTUBE ASSEMBLY SCALE NTS COPYRIGHT © 1995 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD			

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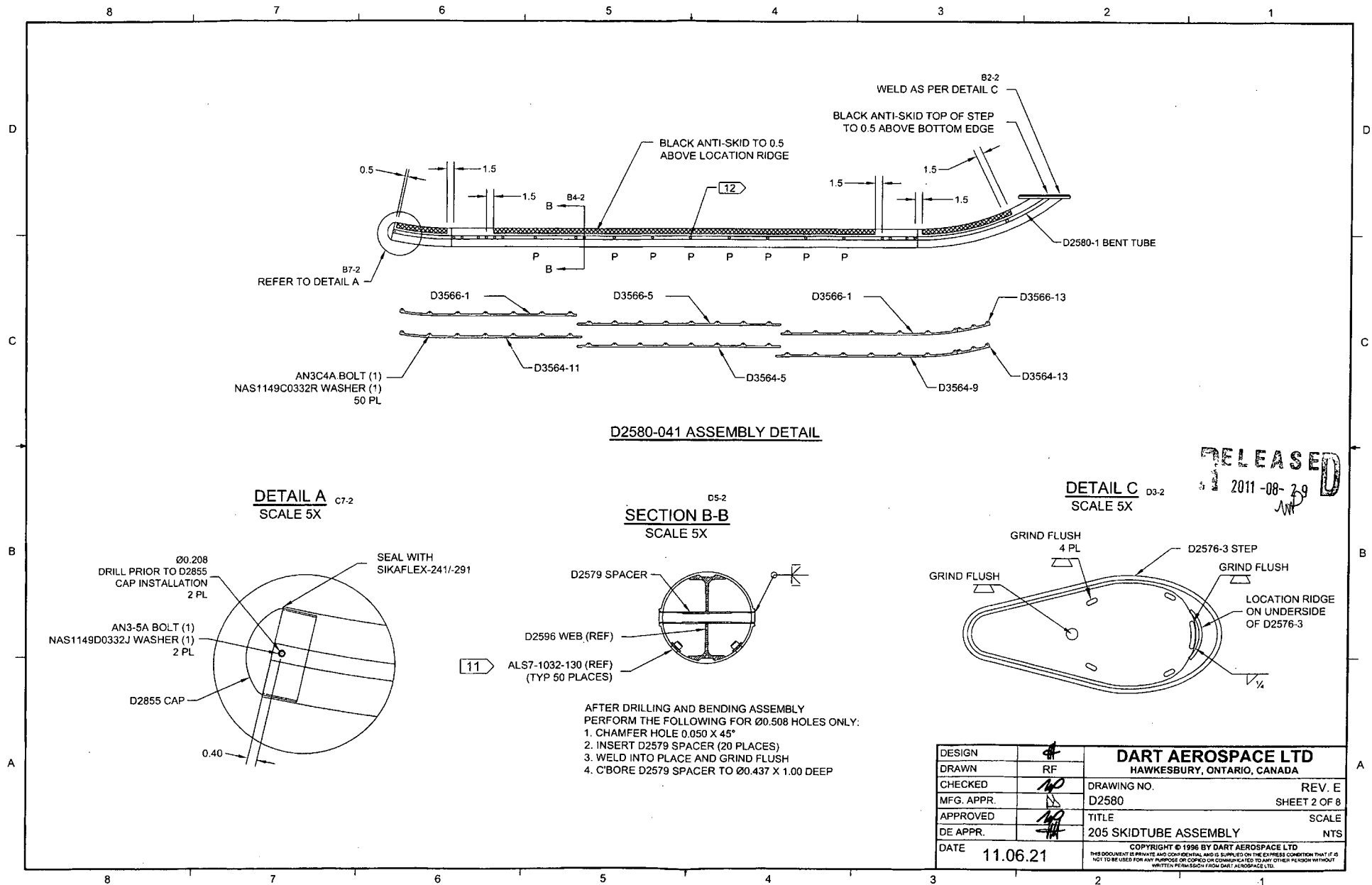
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NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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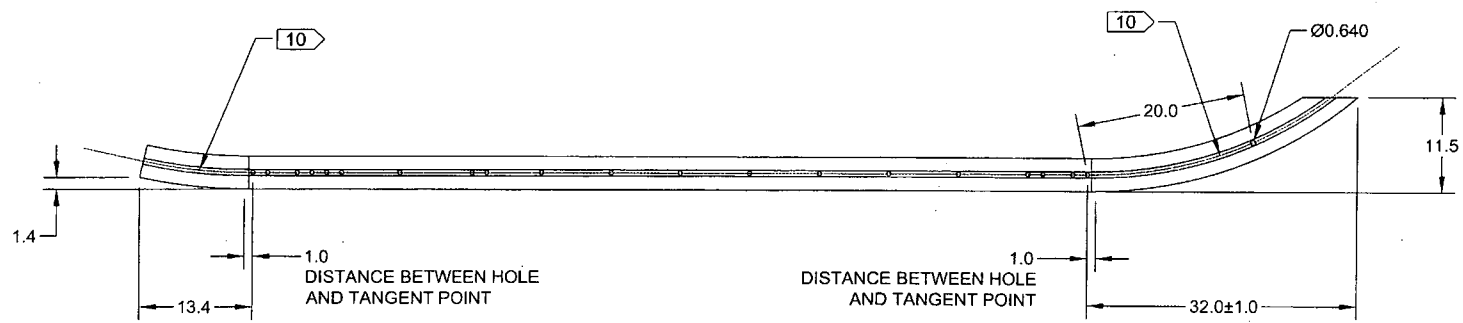
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D2580-1 BENT TUBE
(MAKE FROM D2580-101 TUBE)

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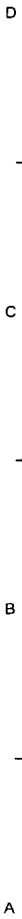
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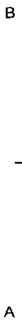
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

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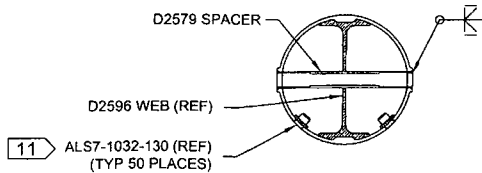
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D2580-045 ASSEMBLY DETAIL

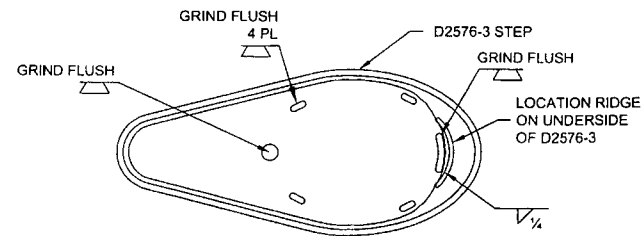


SECTION F-F D5-5
SCALE 5X



**AFTER DRILLING AND BENDING ASSEMBLY
PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:**

- 1. CHAMFER HOLE 0.050 X 45°**
- 2. INSERT D2579 SPACER (24 PLACES)**
- 3. WELD INTO PLACE AND GRIND FLUSH**
- 4. C'BORE D2579 SPACER TO Ø0.437 X 1.00 DEEP**



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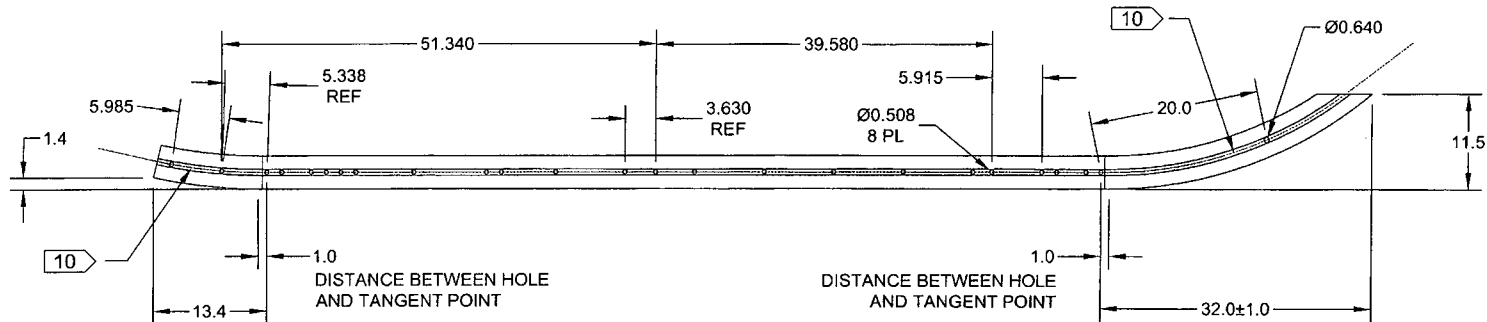
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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D2580-5 BENT TUBE
(MAKE FROM D2580-101 TUBE)

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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

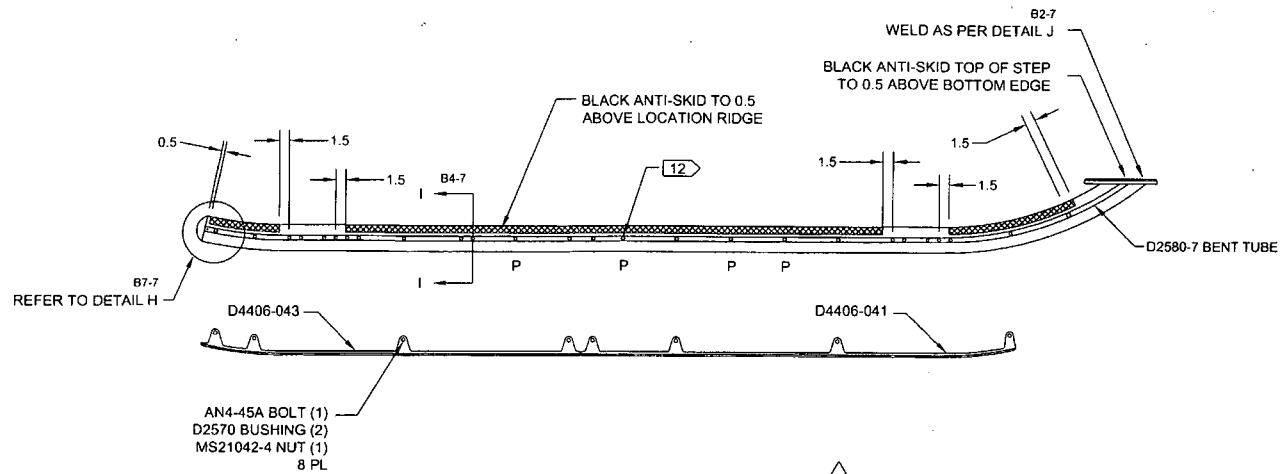
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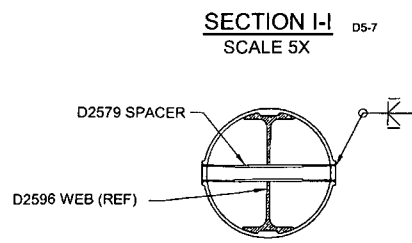
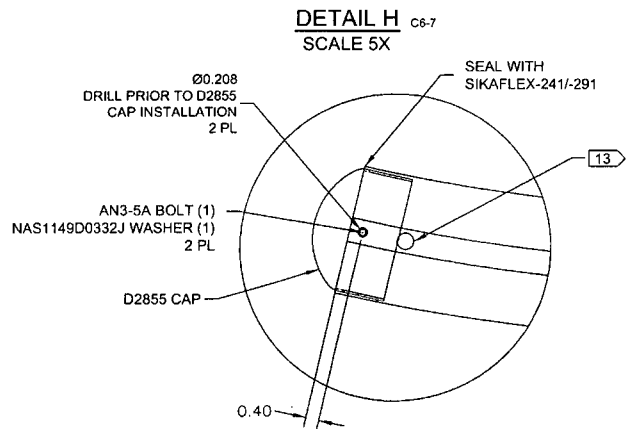
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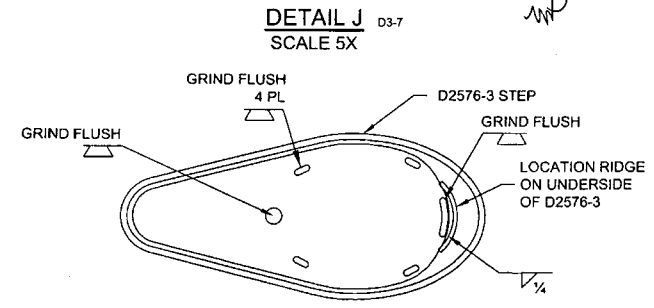
763 49



D2580-047 ASSEMBLY DETAIL E



AFTER DRILLING AND BENDING ASSEMBLY
PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:
1. CHAMFER HOLE 0.050 X 45°
2. INSERT D2579 SPACER (25 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. C-BORE D2579 SPACER TO Ø0.437 X 1.00 DEEP



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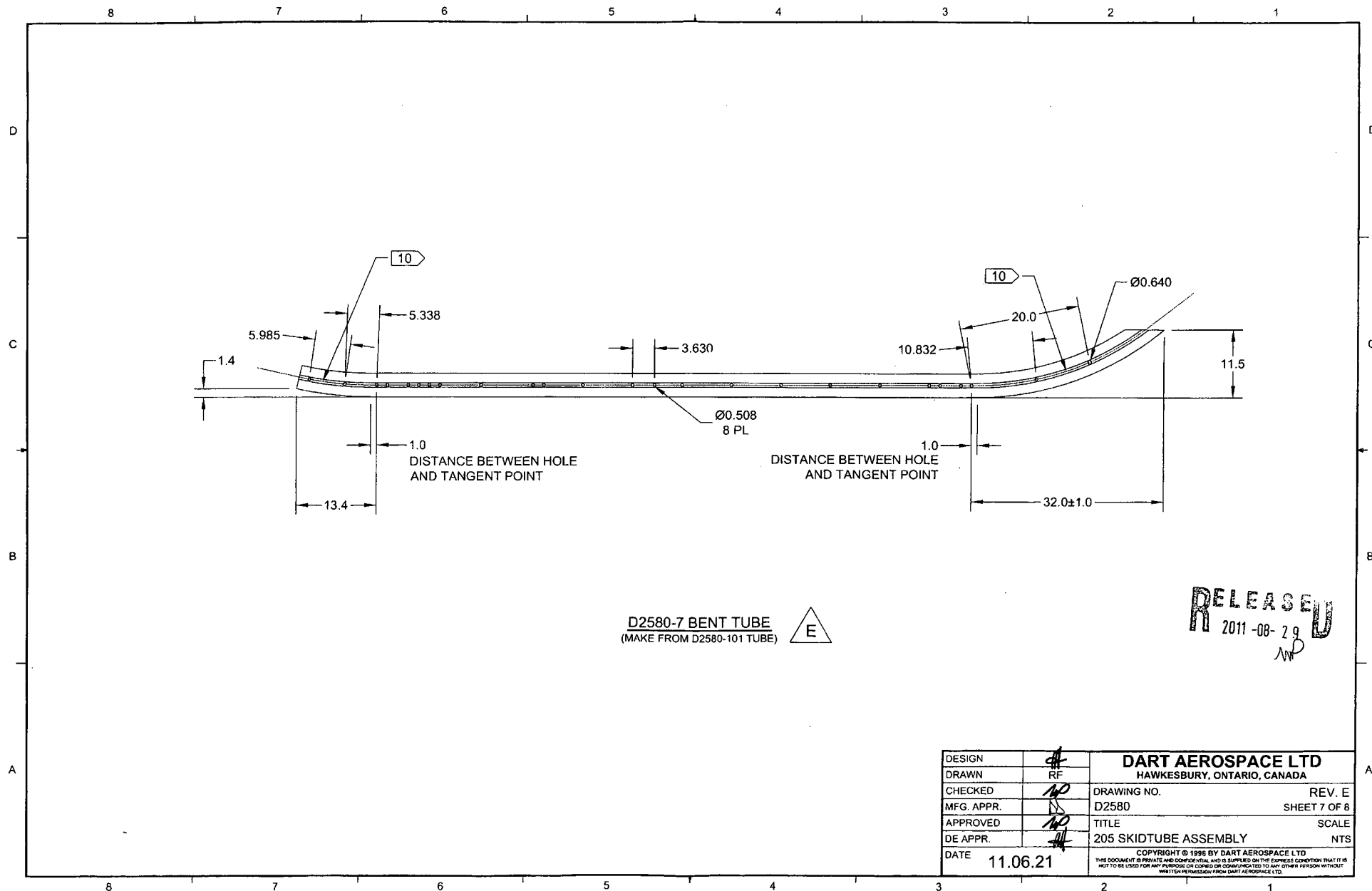
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D2580-7 BENT TUBE
(MAKE FROM D2580-101 TUBE)



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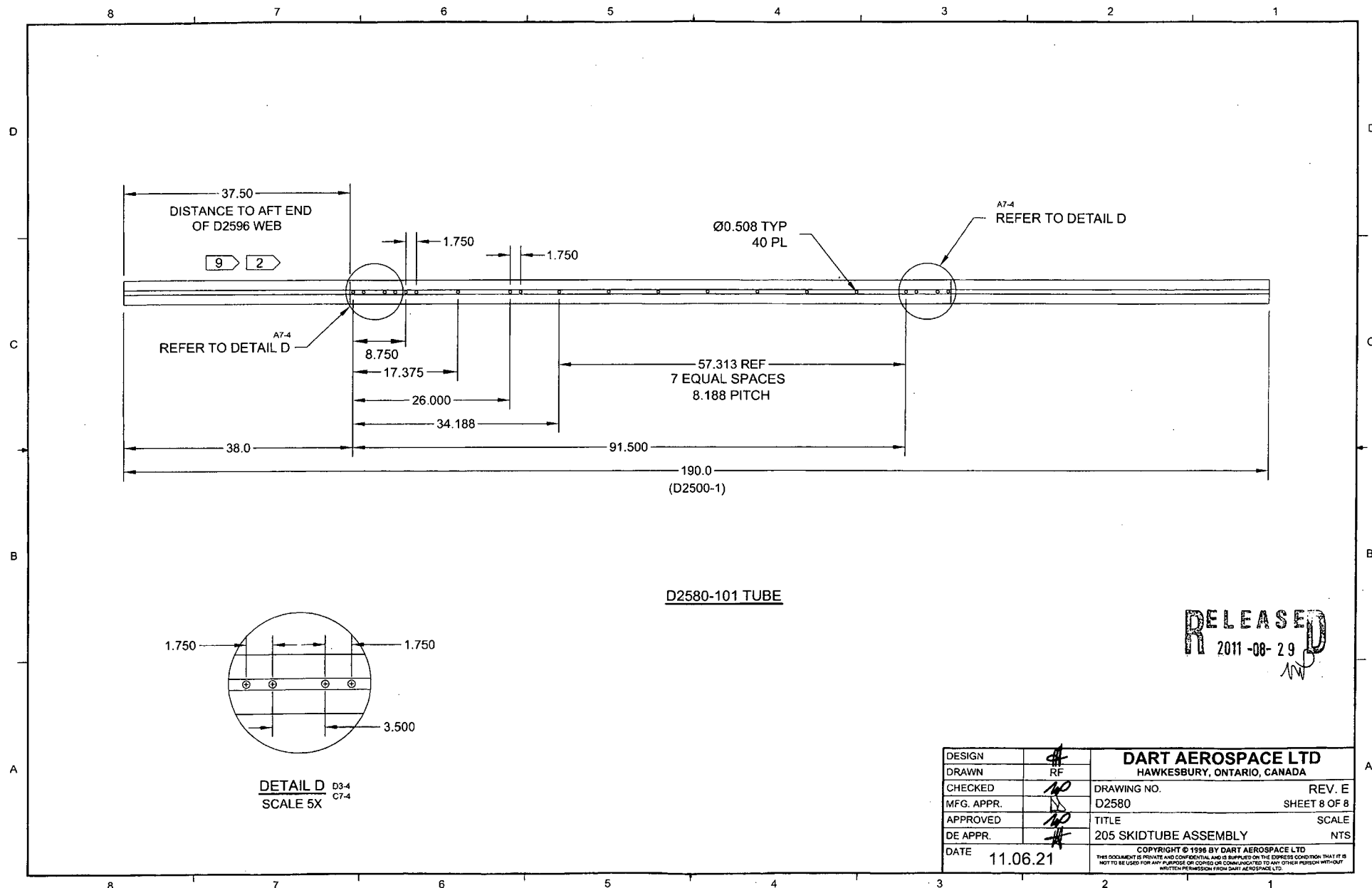
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

NO. 275

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name: Barclay Elliot
Job number: 76550
Part number: 205-634-041
Description: SKID Tube
Welding Process: Tig[☒] Mig[]
Base material: Alum
Current: AC[☒] DC[]

TEST REQUIREMENTS AND RESULTS

Visual: pass[☒] fail[]
Penetration: pass[☒] fail[]

UNACCEPTABLE

Cracks: pass[☒] fail[]
Undercut: pass[☒] fail[]
Pin holes: pass[☒] fail[]
Overlap (cold lap): pass[☒] fail[]
Porosity (surface): pass[☒] fail[]
Coloration: pass[☒] fail[]

Qualifier David Smith Date of Test Coupon 11.11.22
Welder Barclay Elliot Date of Test Coupon 11.11.22

The above named individual is qualified in accordance with AWS D17.1.2001 to weld